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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RUDOLF CAROLUS MARIA BARENDSE,
GABRIEL MARINUS HENRICUS MEESTERS,
and CARL SIDONIUS MARIA ANDELA

Appeal 2010-000540
Application 09/089,871
Technology Center 1600

Decided: June 2, 2010

Before LORA M. GREEN, FRANCISCO C. PRATS, and
JEFFREY N. FREDMAN, *Administrative Patent Judges*.

FREDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to high activity phytase-containing granules. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

Statement of the Case

Background

“The present invention relates to the preparation and formulation of phytase enzymes and their use to prepare granulates for feed-enzymes in animal feeds” (Spec. 1, ll. 11-12).

The Claims

Claims 18, 19, 21, 22, 24, 26-28, 31-35, 41-46, 48, and 50-52 are on appeal. Claims 18 and 19 are representative and read as follows:

18. A high activity phytase-containing granulate having increased pelleting stability comprising the steps of:

(a) providing a non-fibrous solid carrier comprising at least 15% (w/w) of starch;

(b) providing an aqueous liquid comprising a phytase at a concentration of at least 14,000 FTU per gram of aqueous liquid; and

(c) mixing the solid carrier and the aqueous liquid to form a granulate having a phytase activity of at least 6000 FTU per gram; wherein said granulate is prepared by extrusion.

19. A granulate having a phytase activity of at least 6000 FTU per gram and having increased pelleting stability comprising dried granules formed from an aqueous liquid comprising a phytase at a concentration of at least 14,000 FTU per gram of aqueous liquid and a non-fibrous solid carrier which comprises at least 15% (w/w) of starch and at least one divalent cation.

The prior art

Markussen et al.	US 4,106,991	Aug. 15, 1978
Ghani	US 6,120,811	Sep. 19, 2000
Nielsen et al.	WO 95/28850	Nov. 2, 1995
Haarasilta	GB 2139868 A	Nov. 21, 1984

The issues

- A. The Examiner rejected claims 18, 19, 21, 22, 24, 26-28, 31-35, 41-46, 48, and 50-52 under 35 U.S.C. § 112, second paragraph (Ans. 3).
- B. The Examiner rejected claims 18, 19, 21, 22, 24, 26-28, 31-35, 41-46, 48, and 50-52 under 35 U.S.C. § 103(a) as obvious over Nielsen, Ghani, and Haarasilta. (Ans. 4-11).
- C. The Examiner rejected claims 18, 19, 21, 24, 26-28, 31-35, 41-45, 48, and 50-52 under 35 U.S.C. § 103(a) as obvious over Nielsen and Ghani. (Ans. 12-14).
- D. The Examiner rejected claims 22 and 46 under 35 U.S.C. § 103(a) as obvious over Nielsen, Ghani, and Markussen (Ans. 15-17).
- A. *35 U.S.C. § 112, second paragraph*

The Examiner finds that “[c]laims 18-19 . . . are indefinite in the recitation of ‘increased pelleting stability’ for the following reasons. The term is unclear and confusing in the absence of a reference point to compare pelleting stability (i.e., increased with respect to what)” (Ans. 3).

Appellants argue that “not only does the specification inform the skilled person how to determine ‘increased,’ but even if the skilled person needed to look elsewhere, he or she would find a means of measuring ‘increased’ in the prior art and the status of the art” (App. Br. 8).

In view of these conflicting positions, we frame the indefiniteness issue before us as follows:

Does the evidence of record support the Examiner’s conclusion that the phrase “increased pelleting stability” is indefinite?

Findings of Fact (FF)

1. The preamble of Claim 18 is drawn to a “high activity phytase-containing granulate having increased pelleting stability” (Claim 18).

2. The Specification teaches that the “different enzyme granulates were subsequently placed in a pelleting trial and their pelleting stability compared” (Spec. 19, ll. 16-17).

3. The Specification teaches that “Table 2 summarises the results of the pelleting trials. It is apparent that the two granules with the highest enzyme concentration had much higher pelleting stability” (Spec. 19, ll. 23-25).

4. Dr. End teaches that “the skilled artisan, at the time of the invention, using the teachings of the specification and the knowledge known to the skilled artisan, would have understood that the term ‘pelleting stability’ was intended to refer to residual phytase activity in the pellet after the pelleting process, and not to the structural stability of the pellet itself” (End Dec. 2 ¶ 3).

5. Dr. End teaches that “[a]ny modifications to the enzyme itself and/or to the process of granulation that have a tendency to shift the stability curve to the right, i.e., toward a higher temperature tolerance, would be understood by a skilled artisan to result in an ‘increased pelleting stability’” (End. Dec. 5 ¶ 19).

Principles of Law

Because claims delineate the patentee’s right to exclude, the patent statute requires that the scope of the claims be sufficiently definite to inform the public of the bounds of the protected invention, i.e., what subject matter is covered by the exclusive rights of the patent. Otherwise, competitors

cannot avoid infringement, defeating the public notice function of patent claims.

Halliburton Energy Services, Inc. v. M-I LLC, 514 F.3d 1244, 1249 (Fed. Cir. 2008). “Even if a claim term’s definition can be reduced to words, the claim is still indefinite if a person of ordinary skill in the art cannot translate the definition into meaningfully precise claim scope.” *Id.* at 1251.

Analysis

While we agree with Appellants and the End Declaration (FF 4) that the phrase “increased pelleting stability” clearly refers to residual phytase activity, we agree with the Examiner that in the absence of a reference point or a standard for determining “increased pelleting stability” in the Specification, the phrase is indefinite.

We do not find the claim indefinite simply because a term of degree was used, since the fact that “some claim language may not be precise, however, does not automatically render a claim invalid. When a word of degree is used the district court must determine whether the patent’s specification provides some standard for measuring that degree.” *Seattle Box Co., Inc. v. Industrial Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed. Cir. 1984).

However, under the particular facts of this case, the Specification provides no standard for measuring whether a particular granulate has “increased pelleting stability” (FF 2-3). The facts here are similar to those in *Halliburton*, where the court was confronted with a claimed property, a “fragile gel”, and pointed out that “an artisan would not know from one well to the next whether a certain drilling fluid was within the scope of the claims

because a wide variety of factors could affect adequacy.” *Halliburton*, 514 F.3d at 1254. Here too, the ordinary artisan would not know whether a particular granulate fell within the scope of the claims, because multiple factors may affect “pelletting stability”.

Conclusion of Law

The evidence of record support the Examiner’s conclusion that the phrase “increased pelletting stability” is indefinite.

B. 35 U.S.C. § 103(a) over Nielsen and Ghani

The Examiner finds it obvious “to make an *Aspergillus* phytase-containing granulate having at least 6000 FTU per gram which can be used as additive in animal feed, as taught by Nielsen et al., wherein the granulate is made using a carrier that comprises starch, as taught by Ghani” (Ans. 9).

Appellants argue that the term “increased pelletting stability” is “definite and should be given patentable weight” (App. Br. 11). Appellants argue that the “phytase activity in Nielsen is not described in the context of granulates as required in the present claims but rather in the context of total composition. Thus, Nielsen does not teach a granulate having a phytase activity of at least 6000 FTU/gram as required by the claims” (App. Br. 13). Appellants argue that “even if one were to accept [Nielsen’s] ranges as indicating phytase activity in granulates, these broad ranges act as a genus from which the particular species - at least 6000 FTU/gram - is not taught because there is no suggestion of its surprising properties of improved pelletting stability” (App. Br. 14).

Appellants argue that regarding inherency that “there is no disclosure of a granulate of at least 6000 FTU/gram and because the enzyme is added

to an already pelleted animal diet, the Examiner has not established that the reference teaches a product appearing to be substantially identical to the claimed product let alone that the missing descriptive matter is *necessarily present*" (App. Br. 16 -17).

Appellants argue that Ghani "does not teach or suggest a non-fibrous solid carrier which comprises at least 15% (w/w) of starch as required by the claims" (App. Br. 18).

In view of these conflicting positions, we frame the obviousness issues before us as follows:

(i) Does the evidence of record support the Examiner's conclusion that it would have been obvious or inherent to form a "granulate having a phytase activity of at least 6000 FTU per gram" as required by Claims 18 and 19?

(ii) Does the evidence of record support the Examiner's conclusion that it would have been obvious to optimize the amount of starch in the granulate as required by Claims 18 and 19?

Findings of Fact

6. Nielsen teaches "an animal feed additive comprising one or more phytase enzymes and one or more proteolytic enzymes" (Nielsen 9, ll. 28-29).

7. Nielsen teaches that "the animal feed additive of the invention is a granulated enzyme product which may be readily mixed with feed components, or more preferably, form a component of a pre-mix" (Nielsen 10, ll. 16-18).

8. Nielsen teaches that “the amount of phytase activity in the animal feed additive should be in the range of from about 200 to about 50000 FYT . . . per gram of the total composition, preferably in the range of from about 500 to about 10000 FYT per gram of the total composition, most preferred in the range of from about 2000 to about 6000 FYT per gram of the total composition” (Nielsen 11, l. 27 to 12, l. 2).

9. It is undisputed that Nielsen’s “FYT” measure for phytase activity is identical to the “FTU” measure used in the claims (*see* App. Br. 15, note 4 and Ans. 4).

10. Nielsen teaches that “one or more of the enzymes are applied before or after pelleting or extrusion of the feed” (Nielsen 10, ll. 25-26).

11. Nielsen teaches that “12 pigs were divided into two groups. The first group was fed the diet and the second group was fed the same diet but with addition of 20.3 g/100 kg feed of Phytase Novo™ (an *Aspergillus* phytase, 7370 FYT/g)” (Nielsen 17, ll. 5-7).

12. Ghani teaches “enzyme microgranules particularly useful in food and feed applications” (Ghani, col. 1, ll. 12-13).

13. Ghani teaches that “[b]inders useful in the present invention include, for example, hydrolyzed starches (such as Miragel or Pure-Gel . . .) [p]articularly, starch plus corn syrup solids are preferred in the present invention as the combination provides a matrix for fusing the carrier particles together to build the particle size” (Ghani, col. 2, ll. 38-48).

14. Ghani teaches the use of 2% Miragel 463, a starch, in a microgranule (Ghani, col. 3, ll. 33-44).

15. Ghani teaches that the

skilled artisan will readily recognize that the amount of enzyme will be adjusted according to the activity desired for the finished product. Likewise, the amount of polymer, such as Keltone™, will vary from 0.1 to 0.3% according to the thickness of coating required. The amount of corn syrup used, if any, will vary from 4-15% depending on the volume of enzyme liquid and desired particle size of the finished product, and the amount of carrier (such as soy) will be adjusted based on activity and solids in the enzyme concentrate.

(Ghani, col. 3, ll. 45-54).

Principles of Law

The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) secondary considerations of nonobviousness, if any. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966).

The Supreme Court has emphasized that “the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int’l v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). As noted by the Court in *KSR*, “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” 550 U.S. at 421. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

“[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456 (CCPA 1955).

Analysis

Claim Interpretation

We begin with claim interpretation, and in particular, with determining whether the preambles of claims 18 and 19 are limiting. Appellants argue that “the term should be given patentable weight despite its arguable preamble location” (App. Br. 11, note 3).

We are not persuaded. The preamble of Claim 18 is a “high activity phytase-containing granulate having increased pelleting stability” (Claim 18). In this case, the composition of claim 18, requiring two structural components, a starch and a phytase, joined together to form a granulate, represents a situation where the claim body defines a structurally complete invention. The preamble is not necessary to give life or meaning to the claimed composition.

Obviousness

Nielsen teaches that “the amount of phytase activity in the animal feed additive should be in the range of from about 200 to about 50000 FYT . . . per gram of the total composition, preferably in the range of from about 500 to about 10000 FYT per gram of the total composition, most preferred in the range of from about 2000 to about 6000 FYT per gram of the total composition” (Nielsen 11, l. 27 to 12, l. 2; FF 8). Ghani teaches “enzyme microgranules particularly useful in food and feed applications” (Ghani, col. 1, ll. 12-13; FF 12). Ghani further teaches that “[b]inders useful in the

present invention include, for example, hydrolyzed starches (such as Miragel or Pure-Gel) . . . [p]articularly, starch plus corn syrup solids are preferred in the present invention as the combination provides a matrix for fusing the carrier particles together to build the particle size” (Ghani, col. 2, ll. 38-48; FF 13).

The ordinary artisan would have reasonably combined phytase in the amounts suggested by Nielsen for animal feed with binders such as starch suggested by Ghani for use in animal feed. Such a combination is merely a “predictable use of prior art elements according to their established functions.” *KSR*, 550 U.S. at 417.

Appellants argue that the “phytase activity in Nielsen is not described in the context of granulates as required in the present claims but rather in the context of total composition. Thus, Nielsen does not teach a granulate having a phytase activity of at least 6000 FTU/gram as required by the claims.” (App. Br. 13).

We are not persuaded. The Specification teaches that the “granulates desirably are mixed with feed substances, either as such, or as part of a premix” (Spec. 13, ll. 16-17). This is virtually identical to the teaching of Nielsen that the “animal feed additive of the invention is a granulated enzyme product which may readily be mixed with feed components, or more preferably, form a component of a pre-mix” (Nielsen 10, ll. 16-18; FF 7). Nielsen expressly teaches a range for the additive which encompasses 200 to 50000 FTU, and teaches a preferred range for the additive of 2000 to 6000 FTU (*see* FF 8). Therefore, Nielsen teaches an additive, which may be granulated, with a phytase activity of 6000 FTU/gram as required by the

claims (FF 7-8). *See In re Peterson*, 315 F.3d at 1330. (“[T]he existence of overlapping or encompassing ranges shifts the burden to the applicant to show that his invention would not have been obvious.”)

Appellants also “strongly disagree with the applicability of inherency in the context of the present obviousness rejection and that Nielsen inherently teaches or suggests increased pelleting stability or that Nielsen teaches or suggests the granulate as claimed” (App. Br. 15 - 16). Appellants specifically argue that the “Examiner has not made clear that the missing feature of ‘increased pelleting stability’ is *necessarily present* in the additives taught by Nielsen” (App. Br. 16).

We are not persuaded. While we do not find that the phrase “increased pelleting stability” is definite or structurally limits the granulated additive of the Claims, to the extent that incorporation of 4000 to 6000 FTU of phytase into a feed additive results in “increased pelleting stability” (FF 3), Nielsen teaches a preferred range of incorporation of 2000 to 6000 FTU (FF 8).

The Examiner reasonably relies upon Nielsen’s suggestion of a preferred range which fully overlaps the claimed range to shift the burden of proof regarding inherency for “increased pelleting stability” to Appellants. *See In re Best*, 562 F.2d 1252, 1255 (CCPA 1977) (“Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an [A]pplicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. . . Whether the rejection is based on ‘inherency’ under 35 U.S.C. § 102, on ‘prima facie

obviousness’ under 35 U.S.C. § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO’s inability to manufacture products or to obtain and compare prior art products.”)

Appellants argue that “Ghani does not teach or suggest a non-fibrous solid carrier which comprises at least 15% (w/w) of starch as required by the claims” (App. Br. 20).

We are not persuaded. Ghani teaches the use of starch as a binder for feed granulates and exemplifies the use of 2% starch (FF 12-14). More importantly, Ghani teaches that the amounts of the components in the granulate are results effective variables which are readily and routinely adjusted by the skilled artisan based upon desired activities, coating thicknesses, particle size and volumes (FF 15). The Examiner reasonably finds that the “% (w/w) of starch is a matter of choice determined by what is found to be appropriate for the intended granulate” (Ans. 11). *See In re Aller*, 220 F.2d 454, 456 (CCPA 1955) (“[I]t is not inventive to discover the optimum or workable ranges by routine experimentation.”). Appellants have provided no evidence that the particular range of starch used in the claimed invention would not have been obvious.

Secondary Considerations

Appellants argue that “there is no suggestion of its surprising properties of improved pelleting stability” (App. Br. 14). Appellants also argue that the “inventive, highly concentrated granulate overcomes enzyme stability problems arising from high temperatures associated with pelleting during feed processing while retaining high enzyme activity” (App. Br. 19).

We are not persuaded for several reasons. First, the Specification itself does not identify the results of table 2 as unexpected, only that the granules with “the highest enzyme concentration had much higher pelleting stability” (Spec. 19, ll. 24-25). Second, even if the results are asserted as unexpected, the results were not compared with the teachings of Nielsen, which is clearly the closest prior art, and which prefers a range of 2000 to 6000 FTU in the additive (FF 8). See *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991) (“[W]hen unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art.”). Third, Appellants comments regarding stability problems lack evidentiary support. See *In re Pearson*, 494 F.2d 1399, 1405 (CCPA 1974) (“Attorney’s argument in a brief cannot take the place of evidence.”).

Conclusion of Law

(i) The evidence of record supports the Examiner’s conclusion that it would have been obvious or inherent to form a “granulate having a phytase activity of at least 6000 FTU per gram” as required by Claims 18 and 19.

(ii) The evidence of record supports the Examiner’s conclusion that it would have been obvious to optimize the amount of starch in the granulate as required by Claims 18 and 19.

C. 35 U.S.C. § 103(a) over Nielsen, Ghani, and Haarasilta

The Examiner relies upon Nielsen and Ghani as already discussed. The Examiner finds that Haarasilta teaches “a fodder in granulated form which comprises soy oil . . . and teaches that to aid in the formation of stable

granules, inorganic salts can be added which contain divalent cations such as Ca^{2+} or alkaline earth metal cations” (Ans. 5).

Appellants argue that the “skilled artisan would not look to the disclosure of granulates for resisting high acid conditions as taught by Haarasilta to apply to granulates containing enzymes which can withstand high temperatures associated with the pelleting process” (App. Br. 27). Appellants argue that the “skilled artisan would additionally not look to the disclosure of granulates requiring fibrous hay or straw for proper action in the rumen or inorganic salts for decomposition stabilization as taught by Haarasilta to apply to a granulate having a high phytase activity comprising a non-fibrous solid carrier as claimed” (App. Br. 27).

In view of these conflicting positions, we frame the obviousness issue before us as follows:

Does the evidence of record support the Examiner’s conclusion that it would have been obvious to incorporate vegetable oils and divalent cations as taught by Haarasilta into the feed granulates of Nielsen and Ghani?

Findings of Fact

16. Haarasilta teaches an animal feedstuff where “a feed composition is granulated by extrusion under pressure through a matrix” (Haarasilta 1, ll. 5-9).

17. Haarasilta teaches that “[f]urther assistance to the formation of stable granules resisting decomposition in rumen conditions is offered by inorganic salts. Such salts can be formed from sulphate, carbonate, phosphate or the like physiologically tolerable anions and Na, Ca or the like alkali metal or alkaline earth metal cations” (Haarasilta 2, ll. 19-21).

18. Haarasilta teaches that “preferred additives in the production of feedstuff are physiologically tolerable oils, such as linseed oil, soya bean oil, turnip rape oil and paraffin oil. In the granulation step . . . such an oil produces on the grain surface a layer which is hard and smooth as well as dissolution-resistant, and this further delays the decomposition of the granules in the rumen” (Haarasilta 2, ll. 13-17).

19. Haarasilta teaches a feedstuff which will stimulate “rumination and makes the rumen of ruminants work so that a separate course feed is not required” (Haarasilta 1, ll. 36-37).

Analysis

Nielsen and Ghani teach formation of granulate feedstuffs for improving nutrition in animals, particularly including phytase and starch (FF 6-15). Haarasilta teaches that incorporation of calcium salts and vegetable oils result in more stable granules, which Haarasilta explains will stimulate “rumination and makes the rumen of ruminants work so that a separate course feed is not required” (Haarasilta 1, ll. 36-37; FF 16-19).

Appellants argue that the “skilled artisan would not look to the disclosure of granulates for resisting high acid conditions as taught by Haarasilta to apply to granulates containing enzymes which can withstand high temperatures associated with the pelleting process” (App. Br. 27).

We are not persuaded because Haarasilta teaches that the ordinary artisan would have considered increasing the stability of the granulates to improve rumination (FF 16-19), which is a reason to incorporate the calcium and oil components into a granule. *See KSR* at 418 (There must be “a reason that would have prompted a person of ordinary skill in the relevant field to

combine the elements in the way the claimed new invention does.”). Also, Appellants claims incorporate no limitations regarding resistance to “high temperatures” (*see, e.g.*, Claims 18 and 19).

Appellants also argue that the “skilled artisan would additionally not look to the disclosure of granulates requiring fibrous hay or straw for proper action in the rumen or inorganic salts for decomposition stabilization as taught by Haarasilta to apply to a granulate having a high phytase activity comprising a non-fibrous solid carrier as claimed” (App. Br. 27). We are not persuaded because the ordinary artisan, interested in forming a feed additive as taught by Nielsen and Ghani, would have reasonably considered simply improving the stability of the additive as taught by Haarasilta. It is the improved additive, not the final feed composition, which is suggested by the prior art and which renders the claimed invention obvious.

Conclusion of Law

The evidence of record support the Examiner’s conclusion that it would have been obvious to incorporate vegetable oils and divalent cations as taught by Haarasilta into the feed granulates of Nielsen and Ghani.

D. 35 U.S.C. § 103(a) over Nielsen, Ghani, and Markussen

The Examiner finds that that the ordinary artisan would have been motivated to modify the phytase granulate of Nielsen and Ghani to “add a gel- forming compound for the benefit of solidifying the granules and maintaining moisture and softness . . . [and] add PVA since this is one of several binders conventionally used in the art as taught by Markussen et al” (Ans. 16).

Appellants argue that “[b]ecause Markussen’s disclosure is limited to granulates requiring a fibrous carrier, one of skill in the art would not look to Markussen for a high activity phytase-containing granulates comprising a non-fibrous solid carrier as recited in the claims” (App. Br. 23).

We find that the Examiner has the better position. Markussen teaches “a process for the production of an enzyme granulate and the enzyme granulate thus produced” (Markussen, col. 1, ll. 7-8). In *ICON*, the Federal Circuit explained that

“A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem.” *In re Clay*, 966 F.2d 656, 659 (Fed.Cir.1992). In other words, “familiar items may have obvious uses beyond their primary purposes.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 127 S.Ct. 1727, 1742, ... (2007).

In re ICON Health and Fitness, Inc., 496 F.3d 1374, 1379-1380 (Fed. Cir. 2007). Here, Markussen teaches improved methods of formulating enzyme granulates, including the use of gel forming compounds and binders such as PVA (*see* Ans. 16). Markussen is reasonably interpreted as pertinent to Nielsen and Ghani since both Nielsen and Ghani are concerned with the formulation of enzyme granulates (FF 7, 12). The ordinary artisan, interested in improving the enzyme granulates of Nielsen and Ghani, would reasonably have found Markussen pertinent to selection of known components to improve the enzyme granulates (*see* Ans. 16).

SUMMARY

In summary, we affirm the rejection of claims 18 and 19 under 35 U.S.C. § 112, second paragraph. Pursuant to 37 C.F.R. § 41.37(c)(1)(vii)(2006), we also affirm the rejection of claims 21, 22, 24, 26-28, 31-35, 41-46, 48, and 50-52 as these claims were not argued separately.

We affirm the rejection of claims 18 and 19 under 35 U.S.C. § 103(a) as obvious over the two rejections of Nielsen and Ghani, and Nielsen, Ghani and Haarasilta. Pursuant to 37 C.F.R. § 41.37(c)(1)(vii)(2006), we also affirm the rejection of claims 21, 22, 24, 26-28, 31-35, 41-46, 48, and 50-52 as these claims were not argued separately.

We affirm the rejection of claims 22 and 46 under 35 U.S.C. § 103(a) as obvious over Nielsen, Ghani, and Markussen.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv)(2006).

AFFIRMED

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